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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,931	01/29/2004	Youichi Kukimoto	Q79041	1863

23373 7590 10/18/2007  
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WASHINGTON, DC 20037

EXAMINER
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NGUYEN, KHIEM D

ART UNIT	PAPER NUMBER
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2823

MAIL DATE	DELIVERY MODE
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10/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/765,931	Applicant(s) KUKIMOTO ET AL.	
	Examiner Khiem D. Nguyen	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-4 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4 and 8-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

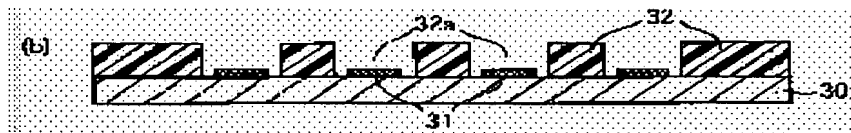
1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on June 07<sup>th</sup>, 2007 has been entered. A new rejection is made as set forth in this Office Action. Claims (2-4 and 8-12) are pending in the application.

### *Claim Rejections - 35 USC § 103*

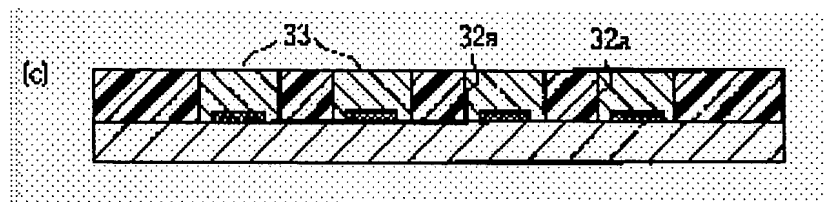
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
3. Claims 2-4 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama Seiki ("Method for forming bump", Japan Publication number 2002-334895, English translation) in view of Amita et al. (U.S. Pub. 2002/0046627).

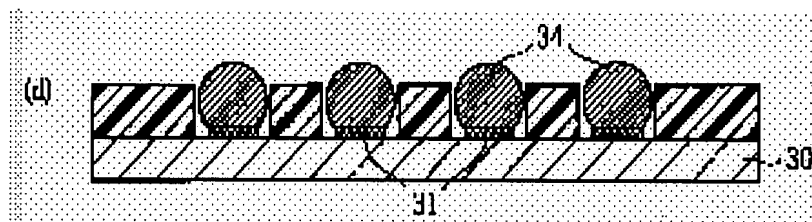
In re claim 8, Sakuyama discloses a solder deposition method comprising the steps of: forming a dam 32 around an electrodes 31 on a substrate 30 (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);



applying a solder precipitating composition 33 to the substrate 30 (FIG. 3c); and



heating the resulting substrate 30 so as to deposit solder 34 on the surface of the electrode 31 (Detailed Description, pages 1-2, paragraphs [0005]-[0006] and FIG. 3d).

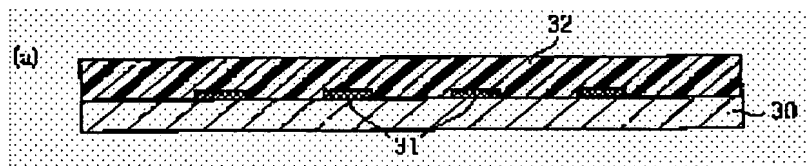


Sakuyama discloses that the solder precipitating composition 33 comprises a pewter paste 33 (Detailed Description, page 2, paragraph [0009]) but does not explicitly disclose or suggest wherein the solder precipitating composition comprises a tin powder, and a complex of at least one member selected from the group consisting of silver ions and copper ions, and at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

Amita, however, disclose a solder deposition method comprise the steps of applying a solder precipitating composition 10 to the substrate 12 wherein the solder precipitating composition comprises a tin powder, and a complex of at least one member selected from the group consisting of silver ions (Sn-Ag) and copper ions (Sn-Cu), (page 4, paragraph [0063] and FIG. 3) and at least one member selected from the group consisting of azoles (benzotriazole) (page 8, paragraph [0115]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Amita to enable the process of applying a solder precipitating composition comprises a tin powder, and a complex selected from silver ions and azoles of Sakuyama to be performed and furthermore to obtain a solder powder which have excellent storage stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita) and also prevent the circuit copper from rusting (page 8, paragraph [0115], Amita).

In re claim 2, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein forming a dam includes the steps of: forming a resin film 32 on the surface of the substrate 30 (FIG. 3a); and



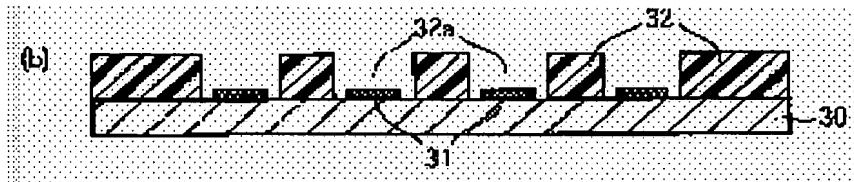
providing an opening part 32a in the resin film 32 so that a dam is formed around an electrode 31 on a substrate 30 (pages 1-2, paragraph [0006], Sakuyama).

In re claim 3, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the dam 32 is not removed after depositing solder 34 (FIG. 3d, Sakuyama).

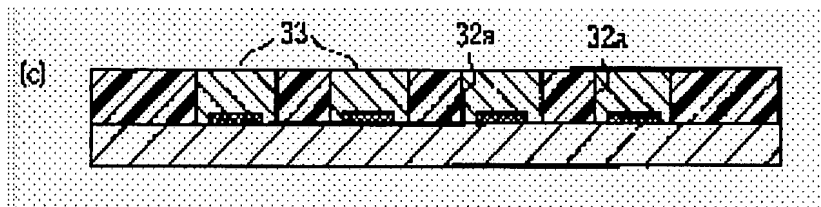
In re claim 4, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the substrate is a via-on-pad structured substrate (pages 1-2, paragraph [0006] and FIGS. 3(a)-(e), Sakuyama).

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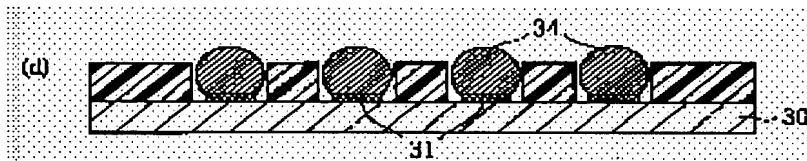
In re claim 9, Sakuyama discloses a solder deposition method comprising the steps of: forming a dam 32 around an electrodes 31 on a substrate 30 (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);



applying a solder precipitating composition 33 to the substrate 30 (FIG. 3c); and



heating the resulting substrate 30 so as to deposit solder 34 on the surface of the electrode 31 while heating the solder precipitating composition 33 applied (Detailed Description, pages 1-2, paragraphs [0005]-[0006] and FIG. 3d).



Sakuyama discloses that the solder precipitating composition 33 comprises a pewter paste 33 (Detailed Description, page 2, paragraph [0009] but does not explicitly disclose or suggest wherein the solder precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead, copper and silver.

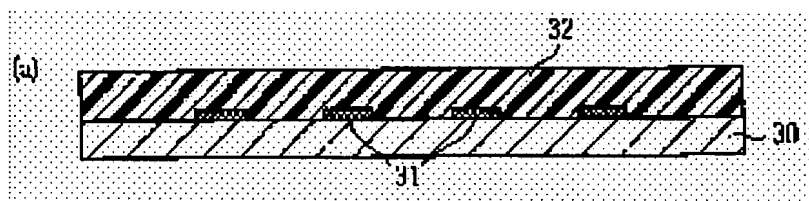
Amita, however, disclose a solder deposition method comprise the steps of applying a solder precipitating composition 10 to the substrate 12 wherein the solder

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precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead (Sn-Pb), copper (Sn-Cu) and silver (Sn-Ag) (page 8, paragraph [0115]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Amita to enable the process of applying a solder precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead, copper and silver of Sakuyama to be performed and furthermore to obtain a solder powder which have excellent storage stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita) and also prevent the circuit copper from rusting (page 8, paragraph [0115], Amita).

In re claim 10, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein forming a dam includes the steps of: forming a resin film 32 on the surface of the substrate 30 (FIG. 3a); and



providing an opening part 32a in the resin film 32 so that a dam is formed around an electrode 31 on a substrate 30 (pages 1-2, paragraph [0006], Sakuyama).

In re claim 11, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the dam 32 is not removed after depositing solder 34 (FIG. 3d, Sakuyama).

In re claim 12, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the substrate is a via-on-pad structured substrate (pages 1-2, paragraph [0006] and FIGS. 3(a)-(e), Sakuyama).

*Response to Applicants' Amendment and Arguments*

4. Applicants' arguments filed on June 07<sup>th</sup>, 2007 have been fully considered but they are not persuasive.

Applicants contend that the references, Sakuyama Seiki (Japan Pub. No. 2002-334895, English translation), herein known as Sakuyama in view of Amita et al. (U.S. Pub. 2002/0046627), herein known as Amita, does not disclose a solder composition method wherein the solder precipitating composition comprises a tin powder, and a complex or salt of silver or copper ions, as recited in Claims 8 and 9.

In response to Applicants' contention that Sakuyama in view of Amita does not disclose a solder composition method wherein the solder precipitating composition comprises a tin powder, and a complex or salt of silver or copper ions, Examiner respectfully disagrees.

Applicants' claimed invention required that the solder precipitating composition comprises a tin powder; and a complex of at least one member selected from the group



consisting of silver ions and copper ions, and at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

Sakuyama discloses a solder deposition process comprising the steps of forming a dam **32** around an electrodes **31** on substrate **20** and applying a solder precipitating composition **33** to the substrate **30** (see Detailed Description, pages 1-2, paragraph [0006] and FIGS. 3b-d), and heating the resulting substrate **31** so as to deposit solder **34** on the surface of the electrode **31**. In (Detailed Description, paragraph [0005] and FIG. 2), Sakuyama discloses depositing pewter paste **23** into opening **22a** of mask **22**. It is well-known to one of ordinary skill in the art at the time of the invention was made that pewter paste is a metal alloy containing tin powder and copper ions with the addition of lead. Furthermore, on (Detailed Description, page 4, paragraph [0022]), Sakuyama suggests that the solder precipitating composition comprises two or more classes which were chosen from Sn, Pb, Ag, Bi, Cu, In, and Zn. Thus, Sakuyama teaches that the solder precipitating composition comprises a tin powder; and a complex of at least one member selected from the group consisting of silver ions and copper ions.

In view of the above, Sakuyama does not explicitly disclose or suggest wherein the solder precipitating composition further comprises at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

The secondary reference, Amita et al., however, discloses applying a solder precipitating composition **10** to the substrate **12** wherein the solder precipitating composition comprises a tin (Sn) powder, and a complex of at least one member selected from the group consisting of silver (Ag) ions and copper (Cu) ions (page 4 paragraphs

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[0063]-[0065] and FIG. 3), wherein the solder precipitating composition further comprises at least one member selected from the group consisting of azoles such as benzotriazole, benzimidazole or tolyltriazole in order to prevent rusting or oxidation (page 8, paragraph [0115]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teaching of Amita into Sakuyama to enable the completed process of solder precipitation composition of Sakuyama to be performed and furthermore to obtain a solder powder which have excellent storage stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita).

For this reason, Examiner holds the rejection proper.

#### ***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KN

October 15, 2007

  
BROOK KEBEDE  
PRIMARY EXAMINER